

Amendments to the Claims

The listing of claims will replace all prior versions and listings of claims in the application.

Listing of claims:

1-17. (Canceled)

18. (Currently Amended) A multi-layered printed wiring board with an inner layer circuit comprising:

a primer resin layer, constituted exclusively of a resin, between said inner layer circuit without roughening treatment and an insulating resin layer, with a surface of the inner layer circuit facing the primer resin layer, and a plating of tin, nickel or an alloy of these metals on the surface of said inner layer circuit facing the primer resin layer.

19. (Canceled)

20. (Previously Presented) The multi-layered printed wiring board according to claim 18, comprising a silane coupling agent layer between said primer resin layer and said plating of tin, nickel or an alloy of these metals.

21. (Previously Presented) The multi-layered printed wiring board according to claim 20, in which said silane coupling agent is selected from an amino-functional silane coupling agent and/or a mercapto-functional silane coupling agent. ✓

22. (Previously Presented) The multi-layered printed wiring board according to claim 18, in which the cross sectional thickness of said primer resin layer is 1 μm to 10 μm . ✓

23. (Previously Presented) The multi-layered printed wiring board according to claim 18, in which said primer resin layer is formed of a resin mixture comprising 20 to 80 parts by weight of an epoxy resin, 20 to 80 parts by weight of a solvent-soluble aromatic polyamide resin polymer and a curing accelerator added in an appropriate amount according to need. ✓

24. (Previously Presented) The multi-layered printed wiring board according to claim 23, in which the aromatic polyamide resin polymer used for said primer resin layer is reaction product between an aromatic polyamide and a rubbery resin. ✓

25. (Previously Presented) The multi-layered printed wiring board according to claim 18, in which said primer resin layer is formed of a resin mixture comprising 5 to 50

parts by weight of an epoxy resin (inclusive of a curing agent), 50 to 95 parts by weight of a poly-ethersulfone resin (having a hydroxy-functional or amino-functional at a terminal thereof, and soluble in a solvent), and a curing accelerator added in an appropriate amount according to need.

26. (Withdrawn – Currently Amended) A method for manufacturing the multi-layered printed wiring board according to claim 18, comprising the steps of:

(a) providing an inner layer circuit with a plating of tin, nickel or an alloy of these metals on a surface thereof;

[(a)] (b) producing a primer resin sheet with a carrier film by coating a resin composition coat as a 2 μm to 12 μm thick primer resin layer on the surface of the carrier film and semi-curing the resin composition coat;

[(b)] (c) bonding of primer resin sheet by superposing the surface of the primer resin sheet with a carrier film against the plated surface of the inner layer circuit board to place the primer resin sheet on the formed inner layer circuit on the inner layer circuit board constituting the multi-layered wiring board, and then releasing the carrier film;

[(c)] (d) processing to form a multi-layered metal clad laminate in which primer resin sheet lies along the surface shape of the inner layer board by superposing

a pre-preg and a metal foil for a conductive layer on the primer resin sheet and hot-pressing the book; and

[(d)] (e) etching of the outer layer metal foil of the multi-layered metal clad laminate to finish the multi-layered printed wiring board with outer layer circuit by forming an outer layer circuit.

27. (Withdrawn – Currently Amended) A method for manufacturing the multi-layered printed wiring board according to claim 18, comprising the steps of:

(a) providing an inner layer circuit with a plating of tin, nickel or an alloy of these metals on a surface thereof;

[(a)] (b) coating of a primer resin for forming a 2 μm to 12 μm thick primer resin layer in a B-stage by coating a resin composition for the primer resin composition onto the plated, formed inner layer circuit surface of the inner layer circuit board;

[(b)] (c) pressing for forming a multi-layered metal clad laminate by superposing a pre-preg and a metal foil for a conductive layer on the primer resin layer, and hot-pressing to get multi-layered printed wiring board with primer resin layer which lies along the surface shape of the inner layer board; and

[(c)] (d) etching of the outer layer metal foil of the multi-layered metal clad laminate to finish the multi-layered printed wiring board with outer layer circuit by forming an outer layer circuit.

28. (Withdrawn – Currently Amended) A method for manufacturing the multi-layered printed wiring board according to claim 18, comprising the steps of:

(a) providing an inner layer circuit with a plating of tin, nickel or an alloy of these metals on a surface thereof;

[[(a)]] (b) producing a primer resin sheet with a carrier film by coating a resin composition coat as a 2 μm to 12 μm thick primer resin layer on the surface of the carrier film and semi-curing the resin composition coat;

[[(b)]] (c) bonding of primer resin sheet by superposing the surface of the primer resin sheet with a carrier film against the plated surface of the inner layer circuit board to place the primer resin sheet on the formed inner layer circuit on the inner layer circuit board constituting the multi-layered wiring board, and then releasing the carrier film;

[[(c)]] (d) pressing for forming a multi-layered metal clad laminate in which primer resin sheet lies along the surface shape of the inner layer board by superposing a resin coated metal foil on the primer resin sheet and hot-pressing to laminate; and

[[(d)]] (e) etching of the outer layer metal foil of the multi-layered metal clad laminate to finish the multi-layered printed wiring board with outer layer circuit by forming an outer layer circuit.

29. (Withdrawn – Currently Amended) A method for manufacturing the multi-layered printed wiring board according to claim 18, comprising the steps of:

(a) providing an inner layer circuit with a plating of tin, nickel or an alloy of these metals on a surface thereof;

[[(a)]] (b) coating of a primer resin for forming a 2 μm to 12 μm thick primer resin layer in a B-stage by coating a resin composition for the primer resin composition onto the plated formed inner layer circuit surface of the inner layer circuit board;

[[(b)]] (c) pressing for forming a multi-layered metal clad laminate in which primer resin sheet lies along the surface shape of the inner layer board by superposing a resin coated metal foil on the primer resin layer and hot-pressing to laminate; and

[[(c)]] (d) etching of the outer layer metal foil of the multi-layered metal clad laminate to finish the multi-layered printed wiring board with outer layer circuit by forming an outer layer circuit.

30. (Withdrawn – Currently Amended) A method for manufacturing the multi-layered printed wiring board according to claim 18, comprising the steps of:

(a) providing an inner layer circuit with a plating of tin, nickel or an alloy of these metals on a surface thereof;

[[(a)]] (b) producing a primer resin sheet with a carrier film by coating a

resin composition coat as a 2 μm to 12 μm thick primer resin layer on the surface of the carrier film and semi-curing the resin composition coat;

[(b)] (c) bonding of primer resin sheet by superposing the surface of the primer resin sheet with a carrier film against the plated surface of the inner layer circuit board to place the primer resin sheet on the formed inner layer circuit on the inner layer circuit board constituting the multi-layered wiring board, and then releasing the carrier film;

[(c)] (d) pressing for forming a multi-layered metal clad laminate in which primer resin sheet lies along the surface shape of the inner layer board by superposing a skeletal material reinforced resin coated metal foil on the primer resin layer and hot-pressing to laminate; and

[(d)] (e) etching of the outer layer metal foil of the multi-layered metal clad laminate to finish the multi-layered printed wiring board with outer layer circuit by forming an outer layer circuit.

31. (Withdrawn – Currently Amended) A method for manufacturing the multi-layered printed wiring board according to claim 18, comprising the steps of:

(a) providing an inner layer circuit with a plating of tin, nickel or an alloy of these metals on a surface thereof;

[(a)] (b) coating of a primer resin for forming a 2 μ m to 12 μ m thick primer resin layer in a B-stage by coating a resin composition for the primer resin composition onto the plated formed inner layer circuit surface of the inner layer circuit board;

[(b)] (c) pressing for forming a multi-layered metal clad laminate in which primer resin sheet lies along the surface shape of the inner layer board by superposing a skeletal material reinforced resin coated metal foil on the primer resin layer and hot-pressing to laminate; and

[(c)] (d) etching of the outer layer metal foil of the multi-layered metal clad laminate to finish the multi-layered printed wiring board with outer layer circuit by forming an outer layer circuit.

32. (Withdrawn) The method for manufacturing the multi-layered printed wiring board according to claim 30, using the skeletal material reinforced resin coated metal foil which is manufactured by the steps of:

(a) forming a varnish layer with predetermined thickness on the surface of a metal foil as a coat by use of a thermosetting resin varnish;

(b) preliminarily drying the varnish layer on the surface of the metal foil by drying the varnish layer to be a dried resin layer;

(c) preliminarily bonding a skeletal material onto the surface of the dried resin layer coated on the surface of the metal foil by superposing the skeletal material thereon and preheating to bond the skeletal material thereon;

(d) impregnating the thermosetting resin into said skeletal material mounted on the surface of the metal foil by heating up at a temperature at which the resin becomes again fluidizable; and

(e) cooling the resin impregnated skeletal material for fabricating the skeletal material reinforced resin coated metal foil by cooling the resin immediately after completion of the resin impregnation to prevent full curing and keeping the semi-cured stage of the thermosetting resin impregnated into the skeletal material.

33. (Withdrawn) The method for manufacturing the multi-layered printed wiring board according to claim 31, using the skeletal material reinforced resin coated metal foil which is manufactured by the steps of:

(a) forming a varnish layer with predetermined thickness on the surface of a metal foil as a coat by use of a thermosetting resin varnish;

(b) preliminarily drying the varnish layer on the surface of the metal foil by drying the varnish layer to be a dried resin layer;

(c) preliminarily bonding a skeletal material onto the surface of the dried resin layer coated on the surface of the metal foil by superposing the skeletal material thereon and preheating to bond the skeletal material thereon;

(d) impregnating the thermosetting resin into said skeletal material mounted on the surface of the metal foil by heating up at a temperature at which the resin becomes again fluidizable; and

(e) cooling the resin impregnated skeletal material for fabricating the skeletal material reinforced resin coated metal foil by cooling the resin immediately after completion of the resin impregnation to prevent full curing and keeping the semi-cured stage of the thermosetting resin impregnated into the skeletal material.

34. (Withdrawn) The method for manufacturing the multi-layered printed wiring board according to claim 26, in which the resin composition used for forming said primer resin layer is obtained by the steps of:

(a) preparing a resin mixture by mixing 20 to 80 parts by weight of an epoxy resin, 20 to 80 parts by weight of a solvent-soluble aromatic polyamide resin polymer and a curing accelerator added in an appropriate amount according to need; and

(b) preparing a resin composition having 25 wt% to 40 wt% of a solid resin content by dissolving the resin mixture in an organic solvent.

35. (Withdrawn) The method for manufacturing the multi-layered printed wiring board according to claim 28, in which the resin composition used for forming said primer resin layer is obtained by the steps of:

(a) preparing a resin mixture by mixing 20 to 80 parts by weight of an epoxy resin, 20 to 80 parts by weight of a solvent-soluble aromatic polyamide resin polymer and a curing accelerator added in an appropriate amount according to need; and

(b) preparing a resin composition having 25 wt% to 40 wt% of a solid resin content by dissolving the resin mixture in an organic solvent.

36. (Withdrawn) The method for manufacturing the multi-layered printed wiring board according to claim 30, in which the resin composition used for forming said primer resin layer is obtained by the steps of:

(a) preparing a resin mixture by mixing 20 to 80 parts by weight of an epoxy resin, 20 to 80 parts by weight of a solvent-soluble aromatic polyamide resin polymer and a curing accelerator added in an appropriate amount according to need; and

(b) preparing a resin composition having 25 wt% to 40 wt% of a solid resin content by dissolving the resin mixture in an organic solvent.

37. (Withdrawn) The method for manufacturing the multi-layered printed wiring board according to claim 27, in which the resin formulation used for forming the primer resin layer, which is formed on the surface of the inner layer circuit board by a coating process, is obtained by the steps of:

(a) preparing a resin mixture by mixing 20 to 80 parts by weight of an epoxy resin, 20 to 80 parts by weight of a solvent-soluble aromatic polyamide resin polymer and a curing accelerator added in an appropriate amount according to need; and

(b) preparing a varnish with resin composition having 8 wt% to 15 wt% of a solid resin content by dissolving the resin mixture in an organic solvent.

38. (Withdrawn) The method for manufacturing the multi-layered printed wiring board according to claim 29, in which the resin formulation used for forming the primer resin layer, which is formed on the surface of the inner layer circuit board by a coating process, is obtained by the steps of:

(a) preparing a resin mixture by mixing 20 to 80 parts by weight of an epoxy resin, 20 to 80 parts by weight of a solvent-soluble aromatic polyamide resin polymer and a curing accelerator added in an appropriate amount according to need; and

(b) preparing a varnish with resin composition having 8 wt% to 15 wt% of a solid resin content by dissolving the resin mixture in an organic solvent.

39. (Withdrawn) The method for manufacturing the multi-layered printed wiring board according to claim 31, in which the resin formulation used for forming the primer resin layer, which is formed on the surface of the inner layer circuit board by a coating process, is obtained by the steps of:

(a) preparing a resin mixture by mixing 20 to 80 parts by weight of an epoxy resin, 20 to 80 parts by weight of a solvent-soluble aromatic polyamide resin polymer and a curing accelerator added in an appropriate amount according to need; and

(b) preparing a varnish with resin composition having 8 wt% to 15 wt% of a solid resin content by dissolving the resin mixture in an organic solvent.

40. (Currently Amended) The multi-layered printed wiring board according to claim 18, in which the surface roughness of said surface of the inner layer circuit facing the primer resin layer is not greater than 2 μm .